L 26460-65    EWT(d)/EWT(1)/EWP(w)/EWT(m)/EWA(d)    JD/EM/EM
ACCESSION NR:    AT5003072                          S/2529/63/000/077/0024/0034

AUTHOR:  Kutikov, A. I.

TITLE:  Some variational methods of solving problems in the <u>theory of elasticity</u>

SOURCE:  Kazan. Aviatsionnyy institut. Trudy, no. 77, 1963. Stroitel'naya mekhanika, 24-34.

TOPIC TAGS:  variational method, elasticity theory, two dimensional problem, Ritz method, Galerkin method, boundary value problem

ABSTRACT:  This article describes some variational methods of solving problems of the theory of elasticity, namely, the methods of Ritz and Galerkin.  The author commences by constructing the variational equations of a two-dimensional problem. After determining the potential energy of an elastic body and the total increment, the author obtains the classical result when the stress tensor is symmetrical and the permutations are assumed trivial.  The author then goes on to explain the Ritz method of solving a boundary value problem.  By taking the independence of the variations of parameters of permutation into account, he obtains the following system of equations:

$$\oint_s t'_{m\gamma}\,\delta_\kappa\,u_\gamma\,ds - \iint_\Omega t_{\beta\gamma}\,\delta_\kappa\,\partial_\beta\,u_\gamma\,d\Omega + \iint_\Omega a^\delta_\kappa\,(t_{\beta\gamma}\partial_\beta t_\gamma - t_{\beta\iota}\partial_\xi t_\jmath)\,d\Omega = 0;$$

Card  1/2

L 26460-65

ACCESSION NR: AT5003072

$$\oint_S u_\tau \, \varepsilon_\chi \, \bar{t}_{n_l} ds - \iint_\Omega \partial_\chi \, u_\tau \, \varepsilon_\chi \, t_{\beta_l} d\Omega + \iint_\Omega ((t_{\beta_l} \, \partial_\beta \, \xi_i - t_{\beta l} \, \partial_\beta \, \xi_i) \chi_\chi \, \alpha d\Omega = 0.$$

After setting up the permutations in the form of series, a system of algebraic e-
quations is derived which can be called a generalized method of Ritz, since the
stresses expressed as permutations vary in some way. The author points out that,
for non-linear theory, the equations of Galerkin, in their classical form, do not
follow from the variational equations of a two-dimensional problem. According to
Galerkin's method, the direct solutions of the differential equations of equili-
brium are determined. The advantage of this method is that it is not necessary
to compose a variational equation. In addition, the series for permutations are
shown to satisfy all the boundary conditions. Orig. art. has: 3 figures and 35
formulas.

ASSOCIATION: Kazanskiy aviatsionnyy institut (Kazan' aviation institute)

SUBMITTED: 10May61          ENCL: 00          SUB CODE: ME, MA

NO REF SOV: 007          OTHER: 000

Card 2/2

KUTIKOV, A.S.

     Pneumatic tube transportation of flour in the Prokopyevsk bakery.
Khleb.i kond.prom. 6 no.6:34-36 Je '62.        (MIRA 15:7)

1.  Prokop'yevskiy khlebozavod, Kuznetskiy basseyn.
   (Prokopyevsk--Bakers and bakeries--Equipment and supplies)
      (Pneumatic-tube transportation)

KUTIKOV, G.; MALYSHEV, G.

Using chemical materials in the maintenance and repair. Avt.
transp. 43 no.8:51  Ag '65.                        (MIRA 18:9)

KUTIKOV, G.F.

Simple pump for circulation of liquids. Zav.lab. 22 no.8:998
Ag '56.                                              (MLRA 9:11)

1. Institut fiziki i matematiki Akademii nauk Azerbaydzhanskoy
SSR.
     (Pumping machinery)  (Laboratories--Apparatus and supplies)

BRYZGOV, N.N., red.; KUTIKOV, G.S., otv. za vypusk; SUKHAREVA, R.A.,
tekhn.red.

[New devices used in automotive transportation] Novye pribory
na avtomobil'nom transporte. Moskva, 1959. 26 p. (Moskovskii
dom nauchno-tekhnicheskoi propagandy. Peredovoi opyt proiz-
vodstva. Seriia: Avtomobil'nyi transport, no.3).
(MIRA 13:10)

(Measuring instruments)    (Transportation, Automotive)

LAMUNIN, Sergey Nikolayevich; KUTIKOV, G.S., red.; GALAKTIONOVA, Ye.N.,
   tekhn.red.; NIKOLAYEVA, L.N., tekhn.red.

   [Operation of special dump trucks] Ekspluatataiia apetsial'nykh
   avtomobilei-samosvalov. Moskva, Nauchno-tekhn.izd-vo M-va avto-
   mobil'nogo transp. i shosseinykh dorog RSFSR, 1960.  56 p.
                    (Dump trucks)                    (MIRA 13:7)

KUTIKOV, Georgiy Semenovich; PLEKHANOV, Ivan Petrovich; SEMINA, N.V.,
red.; GALAKTIONOVA, Ye.N., tekhn. red.

[Maintenance of motor vehicles] Tekhnicheskoe obsluzhivanie av-
tomobilei. Moskva, Nauchno-tekhn. izd-vo M-va avtomobil'nogo
transp. i shosseinykh dorog RSFSR, 1961.  53 p.      (MIRA 14:8)
(Motor vehicles—Maintenance and repair)

STURLIS, Yulian Lyudvigovich; KUTIKOV, G.S., red.; NIKOLAYEVA, L.N., tekhn.
red.

[Mechanized automobile washing] Mekhanizatsiia moiki avtomobilei. Mo-
skva, Nauchno-tekhn. izd-vo M-va avtomobil'nogo tranps. i shosseinykh
dorog RSFSR, 1961.  79 p.                              (MIRA 14:7)
   (Automobiles—Maintenance and repair)   (Washing machines)

KUTIKOV, Georgiy Semenovich; PLEKHANOV, I.P., red.; GORYACHKINA, R.A., tekhn. red.

[Line maintenance work on motor vehicles]Potochnoe tekhnicheskoe obsluzhivanie avtomobilei. Moskva, Avtotransizdat, 1962. 134 p.
(MIRA 15:12)

(Motor vehicles—Maintenance and supplies)

SOV/M-1, Geologia asenovisk. T.I. -2, ... ... ...

(Maintenance of motor vehicle - Terms, Polish. Tekhni-
chivanie avtomobilei. Izd.2, pererab. i dop. Transport,
1964. 61 p.                             (Cont. 17:7)

APALIN, V.; GRITSYUK, Yu.; KUTIKOV, I.; LEBEDEV, V.; MIKHAELYAN, L.

Neutron emission from $U^{233}$, $U235$, and $Pu^{239}$ fission fragments.
IAd. fiz. 1 no.4:639-646 Ap '65.                              (MIRA 18:5)

Kutikov, I. Ye.

Category : Nuclear Physics - Nuclear Reactions                        C-5

Abs Jour : Ref Zhur -Fizika, No 1. 1957, No 557

Author  : Spivak, P. Ye., Yerozolimskiy, B. G., Dorofeyev. G. A.. Lavrenchik, V. N .
          Kutikov, I. Ye., and Dobrynin, Yu. P.

Title   : Determination of the Average Number of Neutrons. $\nu$ eff, Emitted by a
          Single Capture Act for the Isotopes $U^{233}$, $U^{235}$, and $Pu^{239}$ in the
          Ultrathermal Region of Neutron Energies.

Orig Pub : Atom. energiya, 1956, No 3, 13-20

Abstract : The variation of $\nu$eff was measured for the isotopes $U^{233}$, $U^{235}$, and $Pu^{239}$
          in the ultrathermal region of neutron energy. $\nu$ eff of $U^{233}$ remains un-
          changed all the way up to the energies on the order of 100 ev. $\nu$ eff of $Pu^{239}$
          diminishes by 12% during the transition from the thermal spectrum to the
          of 0.15 -- 0.5 ev energy spectrum, and then remains unchanged. $\nu$eff of
          $U^{235}$ remains unchanged upon transition from the thermal spectrum to the
          0.15 -- 0.5 ev energy spectrum, and then drops by 10% upon transition
          to the energy spectrum 8 --130 ev.

Card    : 1/1

Kutikov, I.Ye.

Category : USSR/Nuclear Physics - Nuclear Reactions                    C-5

Abs Jour : Ref Zhur - Fizikr, No 3, 1957, No 6040

Author   : Spivak, P.Ye., Yerozolimskiy, B.G., Dorofeyev, G.A., Lavrenchik,
           V.N., Kutikov, I.Ye., Dobrynin, Yu.P.
Title    : Average Number of Neutrons $_{eff}$ Emitted by the $U^{233}$, $U^{235}$, and
           $Pu^{239}$ Isotopes Upon Capture of Neutrons with Energies from
           30 -- 900 kev.

Orig Pub : Atom. energiya, 1956, No 3, 21-26

Abstract : The values of $\nu_{eff}$ of $U^{233}$, $U^{235}$, and $Pu^{239}$ were measured for
           30 -- 900 kev neutrons by means of a method employing two
           indicator systems, having a different dependence of the ef-
           ficiency of the neutron energy.  The primary-neutron sources
           employed were the photoneutron sources $Sb^{124}$ + Be (30 kev),
           $Ge^{72}$ + D2O (140 kev) $Na^{24}$ + $D_2O$ (250 kev), and $Na^{24}$ + Be (900
           kev).
               The results obtained are listed in the table:

Card     : 1/2

Category : USSR/Nuclear Physics - Nuclear Reactions                    C-5

Abs Jour : Ref Zhur - Fizikr, No 3, 1957, No 6040

|   | ENERGY (KEV) | $U^{233}$ | $U^{235}$ | $Pu^{239}$ |
|---|---|---|---|---|
| I | 30 | 2.25+0.07 | 1.86+0.04 | 2.01+0.05 |
|   | 140 | 2.43+0.12 | 2.12+0.10 | 2.35+0.12 |
|   | 250 | 2.45+0.12 | 2.21+0.15 | 2.60+0.18 |
| II | 250 | 2.46+0.10 | 2.00+0.10 | 2.50+0.11 |
|   | 900 | 2.60+0.13 | 2.28+0.08 | 2.57+0.12 |

G.D.

Card     : 2/2

USSR/Nuclear Physics - Nuclear Reactions.                    C-5

Abs Jour    :  Ref Zhur - Fizika, No 4, 1957, 8807

was determined in one specimen by measuring the number
of spontaneous fissions in a multi-layer ionization cham-
ber;  in other specimens the relative amount of $Pu^{240}$
was determined by comparing the areas of the dips in the
resonance of $Pu^{240}$ at 1.06 ev on the transmission curves,
obtained by means of a mechanical neutron selector.

The procedure for determining $\nu_{eff}$ is based on the
measurement of  the effect of the capture and production
of neutrons from the disturbance to the neutron field in
a graphite prism with a central cavity, in which the in-
vestigated specimen is placed (see Referat Zhur Fizika,
1957, 557).  The ratios  $\nu''_{eff}/\nu'_{eff}$ of specimens

with and without $Pu^{240}$ admixtures were measured.  The
results of the measurements are given in the following
table:

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USSR/Nuclear Physics - Nuclear Reactions.

C-5

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8807

Percentage $Pu^{240}$ in the specimen.
0   1,6      2,5         6,5            16

Weight of specimen, grams.
8   0,55    0,39    1,00   0,51    1,02    0,52    0,99

$\nu''$-eff behind gadolinium filter.
1,00  0,97    0,96    0,96    0,86    0,87    0,77    0,83

$\nu''$ eff Behind cadmium filter.
1,00  0,84    1,81    1,87            0,49    0,55

The resonance integral of absorption of $Pu^{240}$ is
$\Sigma_{240} = (9,000 \pm 3,000) \times 10^{-24}$ $cm^2$.

Card 3/3

KUTIKOV, I. E.

Measurement of η for uranium-233, uranium-235 and plutonium-239 with epithermal neutrons. P. N. Shirak, E. G. Brazdinskii, A. A. Theodev, V. N. Lisssolit, I. E. Kutikov, and Yu. P. Dukevnia, *Atomic Energy* (English translation) 1, No. 3 (Pub. in Nuclear Energy 4, 70–91, 857)).—For the η value for Pu in the thermal spectrum to a spectrum bounded by 0.5 e.v., but remains const. thereafter. For the η value for the thermal spectrum and that between 0.15 and 0.5 e.v., but falls by 15% on passing to the spectrum from 8 to 18 e.v.

*KUTIKOJ I YE*

AUTHORS  Dobrynin Yu.N., Dorofeyev,G.A., Kutikov I.Ye.    89-10-9/36
TITLE  Measurement of Resonance Absorption Integrals in Zirconium Speci-
mens.
(Izmereniya rezonansnykh integralov pogloshcheniya obraztsov tsir-
koniya - Russian)

PERIODICAL  Atomnaya Energiya, 1957, Vol 3, Nr 1o, pp 323 - 324 (U.S.S.R.)

ABSTRACT
Zirconium specimens with a different content of hafnium were in-
troduced into the center of a graphite prism and irradiated with a
collimated neutron beam of the reactor B.B.P. Measurements were
connected with the resonance integral for boron $\sum' = 375 b$.

$$\int_{0,4eV}^{\infty} \sigma(E) \frac{dE}{E}$$ was measured at $(2,3 \pm 0,5) b$ for pure zirconium.

There are 1 table and 2 Slavic references.

SUBMITTED  May 2o, 1957
AVAILABLE  Library of Congress.
Card 1/1

KUTIKOV, I.YE.

89-10-12/36

AUTHORS      Dorofeyev, G.A., Kutikov, I.Ye., Kucher, A.M.

TITLE        Comparison between USSR and Swedish Neutron Standards.
             (Sravneniye standartnykh neytronnykh istochnikov SSSR
             i Shvetsii.)

PERIODICAL   Atomnaya Energiya, 1957, Vol. 3, Nr 10, pp.328-330
             (USSR)

ABSTRACT     The Russian neutron standard source $H_{26}$ was measured
             in 1952 at $(4.70 \pm 0,30) \cdot 10^5 n/sec$,
             and the source $H_{22}$ was measured in 1951 at
             $(5.96 \pm 0,17) \cdot 10^5 n/sec$.
             The Swedish neutron standar source $Q_1$ was measured
             1952-1954 by Larson at $(2,65 \pm 0,05) \cdot 10^6 n/sec$. On
             the occasion of Larson's visit to Moscow the three
             sources were compared among one another and
             $Q_1/Q_{H22} = 0,459 \pm 0,5 \%$ and $Q_{H26}/Q_{H22} = 0,082 \pm 0,5 \%$
             was measured. If, in addition the time factor is
             taken into account, the three sources have (for 1957)
             the value:

CARD 1/2

Comparison between Ussr and Swedish Neutron Standards.

$$Q_{H26} = 6,07 \cdot 10^6 \, n/sec$$

$$Q_{H22} = 4,82 \cdot 10^5 \, n/sec$$

$$Q_1 = (2,86 \pm 0,06) \cdot 10^6 \, n/sec.$$

There are 2 tables, 1 figure and 6 Slavic references.

ASSOCIATION:  None given.
SUBMITTED:   20.5. 1957.
AVAILABLE:   Library of Congress.

CARD 2/2

DOBRYNIN, Yu.N.; DOROFEYEV, G.A.; KUTIKOV, I.Ye.

Measurement of resonance absorption integrals in zirconium
specimens. Atom.energ. 3 no.10:323-324 O '57.          (MIRA 10:10)
        (Zirconium)    (Neutrons) (Nuclear reactors)

DOROFEYEV, G.A.; KUTIKOV, I.Ye.; KUCHER, A.M.

Comparison of U.S.S.R. and Swedish neutron standards. Atom.energ.
3 no.10:328-330 O '57.                                   (MIRA 10:10)
                        (Neutrons)

SOSNOVSKIY, A.N. [deceased]; SPIVAK, P.Ye.; PROKOF'YEV, Yu.A.; KUTIKOV, I.Ye.;
    DOBRYNIN, Yu.P. [deceased].

    Half life of a neutron. Zhur. eksp. i teor. fiz. 35 no.4:1059-1061
    O '58.                                              (MIRA 12:1)
                      (Neutrons--Decay)

2! (8)

AUTHORS:     Apalin, V. F., Dobrynin, Yu. P.          SOV/89-7-4-11/28
(Deceased), Zakharova, V. P., Kutikov, I. Ye., Mikaelyan, L. A.

TITLE:       The Mean    Number of Neutrons Emitted by $U^{235}$ in    Triple
Fission

PERIODICAL:  Atomnaya energiya, 1959, Vol 7, Nr 4, pp 375-376 (USSR)

ABSTRACT:    The triple fission of heavy nuclei with emission of $\alpha$-particles
is a very rare and comparatively little investigated phenomenon.
The $\alpha$-particle spectrum is then continuous, has a broad maximum
at an energy of about 15 Mev, and extends up to 28 Mev. The
$\alpha$-particles are essentially emitted in a direction that is
perpendicular to that of the departure of the fragments.
Some clearness might be obtained with respect to the initial
stages of fission processes by investigating triple fission.
It is interesting that the boundary of the energy spectrum of
$\alpha$-particles (28 Mev) is noticeably higher than the value that
might be furnished by the forces of Coulomb repulsion of the
uranium nucleus. According to the authors' opinion, investi-
gation of the characteristics of triple fission as a function
of the ratio of the fragment masses and investigation of the
energy balance is of great interest. The quantity of neutrons

Card 1/3

The Mean      Number of Neutrons Emitted by U$^{235}$ in a          SOV/89-7-4-11/28
Triple Fission

flying away in fission is a measure for the excitation of the
fragments. The authors therefore determined the average number
v of neutrons emitted in a triple fission of the compound
nucleus U$^{236}$. The investigation was carried out on an electron
beam of a VVR-reactor. A U$^{235}$ layer of 0.7 mg/cm$^2$ thickness was
applied to the central electrode of the double ionization
chamber. Counting the fission fragments is briefly described.
The mean lifetime of the neutrons in the scintillator was
11 microseconds. A total of 5,000 cases of triple fission was
recorded. The average number of neutrons per triple fission is
1.77 ± 0.09. If the thickness of the aluminum filter amounts
to 35 μ, the system recorded triple fissions in which
α-particles with an energy of more than 9 Mev fly off. The
authors deemed it to be of essential importance to clear up the
connection between v and α-particle energy. This dependence
was measured by means of an aluminum filter of 135 μ thickness.
The apparatus recorded only such cases of triple fission in
which α-particles with an energy of more than ~ 22 Mev were
emitted. The counting rate amounted to 40 coincidences per hour.

Card 2/3

The Mean    Number of Neutrons Emitted by $U^{235}$ in a        SOV/89-7-4-11/28
Triple Fission

The mean value of $\nu$ in E $>$ 22 Mev amounted to $1.79 \pm 0.13$,
which agrees with the results of previous measurements within
the limits of measuring errors. The excitation energy of the
fragments does not depend on the energy of $\alpha$-particles with
long ranges, which are produced in triple fission. A decrease
of $\nu$ indicates that the excitation energy of fragments in a
triple fission is less by at least 4 to 5 Mev than in the case
of a double fission. According to N. Bohr and I. Wheeler
(Ref 7), the fragments are deformed before scission of the
neck, and the potential energy of deformation further goes
over into the excitation energy. The observed decrease of the
excitation energy of fragments is probably connected with the
decrease of their initial deformation. The authors thank K. S.
Mikhaylov and his collaborators for their assistance in
producing the scintillation preparations. There are 7 references,
1 of which is Soviet.

SUBMITTED:    May 4, 1959

Card 3/3

24(1)

SOV/56-36-4-7/70

AUTHORS:      Sosnovskiy, A. N. (deceased), Spivak, P. Ye., Prokof'yev, Yu. A.,
              Kutikov, I. Ye., Dobrynin, Yu. P. (Deceased)

TITLE:        Measurement of the Half-life of the Neutron (Izmereniye perioda
              poluraspada neytrona)

PERIODICAL:   Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
              Vol 36, Nr 4, pp 1012-1018 (USSR)

ABSTRACT:     In the introduction the methods and results of work recently
              carried out in the USA and in the USSR are discussed. Estimates
              made of neutron half-life amounted to 10-30 min (Ref 1),
              9-25 min (Ref 2), and 8-15 min (Spivak, Sosnovskiy, Ref 4);
              more detailed data are given by reference 3: 12.8 $\pm$ 2.5 min
              and 12.0 $\pm$ 1.5 min (Ref 4). For the half-life of the neutron it
              holds that (1): $T = kJ \ln 2/N_p$; J is the neutron density inte-
              gral, k depends only on the geometry of the experiment and on
              neutron distribution in the beam. The neutron beam used was
              obtained from the RFT-reactor; Figure 1 gives a schematical
              view of the experimental device. Chapter 2 of the paper gives
              a description of this device and of the experimental principle.
Card 1/3      Chapter 3 deals with neutron density measurements in the beam.

Neutron density was determined by the activation of sodium- and gold targets. The cross section for sodium follows from the $1/v$-law; it holds that $\sigma_{absorp} = (98 \pm 1.5) \cdot 10^{-24} cm^2$ at $E = 0.025$ ev. In the case of gold a deviation from the $1/v$-law was found; it has a cross section of $0.5 \cdot 10^{-24} cm^2$. For density $c = 2.17 \cdot 10^5$ neutrons/$cm^3 \pm 1.8\%$ is obtained. For the density integral it follows that $J = (7.68 \pm 0.15) \cdot 10^4$ neutrons/cm. In the next chapter the authors investigate the problems of the recording of decay protons, i.e. of determining $N_p$ from formula (1). If the counter records $n_p$ protons, it holds that $n_p = a N_p$; $a$ was determined as amounting to $0.543 \pm 0.006$. From 25 series of measurements the following was obtained after extrapolation and after consideration of $a$: $N_p = 55.6 \pm 0.54$ protons min.

Chapter 5 deals with the determination of $k$ from formula (1). Calculations by means of a computer resulted in a value of $k = 7.87 \cdot 10^{-3}$ cm; if density distribution is taken into account

Card 2/3

Measurement of the Half-life of the Neutron.                    SOV/.6-38-4-7/70

$7.84 \cdot 10^{-5}$ cm is found. The values thus obtained for J, $N_p$, and k are then inserted into (1) and give a neutron half-life of T = (11.7 $\pm$ 0.3) min. Herefrom the reduced life of the neutron is found to amount to fT = 1180 $\pm$ 40 (f was calculated according to the table by Dzhelepov and Zyryanova (Ref 8)). The authors finally thank Academician I. V. Kurchatov for his interest in the work, and they also express their gratitude to the mathematical team M. R. Shura-Bura, Ye. S. Kuznetsov, I. G. Krutikova, V. N. Toroptseva and O. B. Moskalev, and, finally, also to the RFT reactor team. There are 3 figures, 1 table, and 11 references, 2 of which are Soviet.

SUBMITTED:     September 29, 1958

Card 3/3

21(8)

SOV/56-35-4-43/52

AUTHORS: Sosnovskiy, A. N.(Deceased), Spivak, P. Ye., Prokof'yev, Yu.A.,
Kutikov, I. Ye., Dobrynin, Yu. P. (Deceased)

TITLE: Measurement of the Half-Life of the Neutron (Izmereniye
perioda poluraspada neytrona)

PERIODICAL: Zhurnal eskperimental'noy i teoreticheskoy fiziki, 1958,
Vol 35, Nr 4, pp 1o59-1o61 (USSR)

ABSTRACT: The authors of the present paper determined the half-life
of the neutron much more accurately than in previous papers.
The present paper was also inspired by the great interest
caused by the form of $\beta$-interaction. The longitudinal sec-
tion through the measuring apparatus used is shown by a
schematical drawing. A well-collimated neutron beam from the
reactor $P\Phi T$ passed through an evacuated chamber. The
protons produced by neutron decay were focused on to the window
of a proportionality counter. A formula for calculating the
half-life T is given. The authors found the value
$T = (11.7 \pm 0.3)$ minutes for the half-life of the neutron
and this furnishes a neutron ft-value of $1180 \pm 35$. There

Card 1/2    are 1 figure and 4 references, 1 of which is Soviet.

21.1000,24.6510

77208
SOV/89-8-1-2/29

AUTHORS:     Apalin, V. F., Dobrynin, Yu. P. (deceased), Zakharova,
             V. P., Kutikov, I. Ye., Mikaelyan, L. A.

TITLE:       Number of Neutrons Emitted From Individual Fission
             Fragments of U235

PERIODICAL:  Atomnaya energiya, 1960, Vol 8, Nr 1, pp 15-21 (USSR)

ABSTRACT:    As is well known, the excitation energy in a fission
             process is used up according to the equation:

$$E(M) = \nu(M)\,\varepsilon(M) + \varepsilon_\gamma(M)$$

where M is mass of the fragment; $\nu$ is average number
of neutrons liberated from the fragments; $\varepsilon_\gamma$ is
energy carried away by $\gamma$ quantas; $\varepsilon(M)$ is average
energy necessary to evaporate one neutron. Since $\varepsilon_\gamma$
is quite insensitive to the variation of the mass ratio

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Number of Neutrons Emitted From Individual            77298
Fission Fragments of U235                              SOV/89-5-1-2/29

of the fragments and their excitation energy, an investi-
gation of the neutron emission from individual fragments
enables one, in the opinion of the authors, to collect
data about the excitation energy distribution among
individual fragments.  Since, according to the view
of N. Bohr and J. Wheeler, this energy originates from
the deformation energy of the fragments immediately
after fission, these data would be useful for investi-
gation of these original deformations.  Similar experi-
ments by J. Fraser and J. Milton were done in Canada
in 1954 on $U^{233}$, and the authors wanted to see if the
$U^{233}$ results were typical for all fissionable atomic
species or not.  The detector on Fig. 1 is very similar
to that used by Relnes, et al., with the exception of
the scintillating substance, which was a solution of a
4 g/l concentration of 2.5-diphenyloxasol in dioxane,
with an added saturated water solution of cadmium
nitrite computed to contain one atom of cadmium for
every 400 atoms of hydrogen.  The coincident impulse of
the fragments opens a 25 $\mu$ sec door, allowing the

Card 2/12

Number of Neutrons Emitted From Individual
Fission Fragments of U235

SOV...
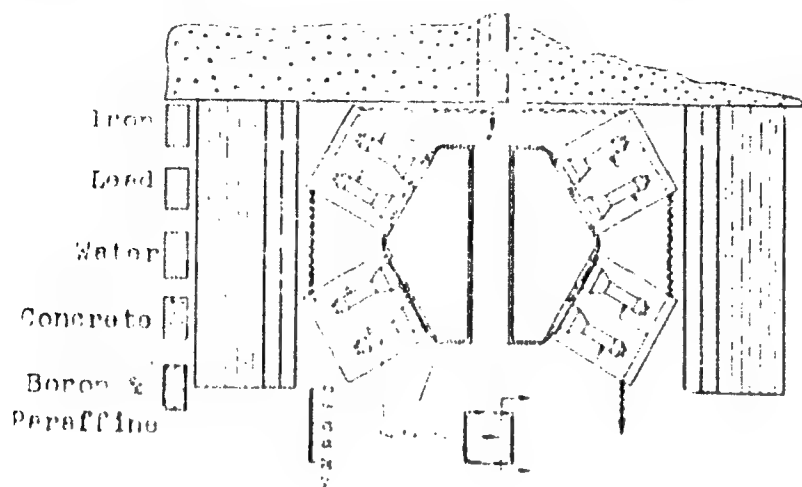
Iron

Lead

Water

Concrete

Boron &
Paraffine

Fig. 1. Setup scheme: (1) double ionization chamber with
grids; (2) scintillation tank for neutron detection;
(3) photomultipliers; (4) collimated neutron beam.

Card 3/12

Number of Neutrons Emitted From Inelastic
Fission Fragments of U 35

detector impulses to proceed toward a fast-counting
device and the simultaneous impulses from the double
ionization chamber to enter the ratio analyzer. A
delay of 0.6 $\mu$sec after fission is introduced to
exclude the registration of the instantaneous $\gamma$-rays
accompanying fission. Resolving time of the neutron
containing channels is 6.4 $\mu$sec, and all information
is recorded on a registering device. The channels
covered the 2.2-1/... domain of the ratios and registered
on the average 60 fissions/min. The authors registered
a total of 500,000 fissions and some 25,000 impulses
in the neutron detectors. 85,000 of them were due to
the fission neutrons, and the rest to a background of
scattered $\gamma$-rays and neutrons from the beam. In
addition to getting the total neutron yield from the
separate fragment yields $\nu(M)$ (which necessarily con-
tained corrections for the varying sensitivity of the
detector to different relative angles between the
neutrons and fragments), the ionization chamber was put
into the center of the detector in order to collect all

Card 4/1-

Number of Neutrons Emitted From Individual
Fission Fragments of U235

77398
SOV/89-8-1-2/29

the neutrons in a $4\pi$ solid angle geometry. The
authors registered 15 coincidences per minute; the
background was of the order of one count per fission.
Here the total number of fission was about 70,000.
Corrections were made for the thickness of the support
and the ionization loss according to the procedures
described earlier in the literature; the efficiency
of neutron detection as a function of the fragment
velocity, efficiency $\eta(M,q)$, was computed from:

$$\eta(M,q) = const(1+r)^2, \quad r = \sqrt{\frac{E(M)}{Mq}} \quad (1)$$

where $E(M)$ is kinetic energy of the fragment of mass
M and q is neutron energy in the coordinate system of
the moving fragment. The authors used the formula:

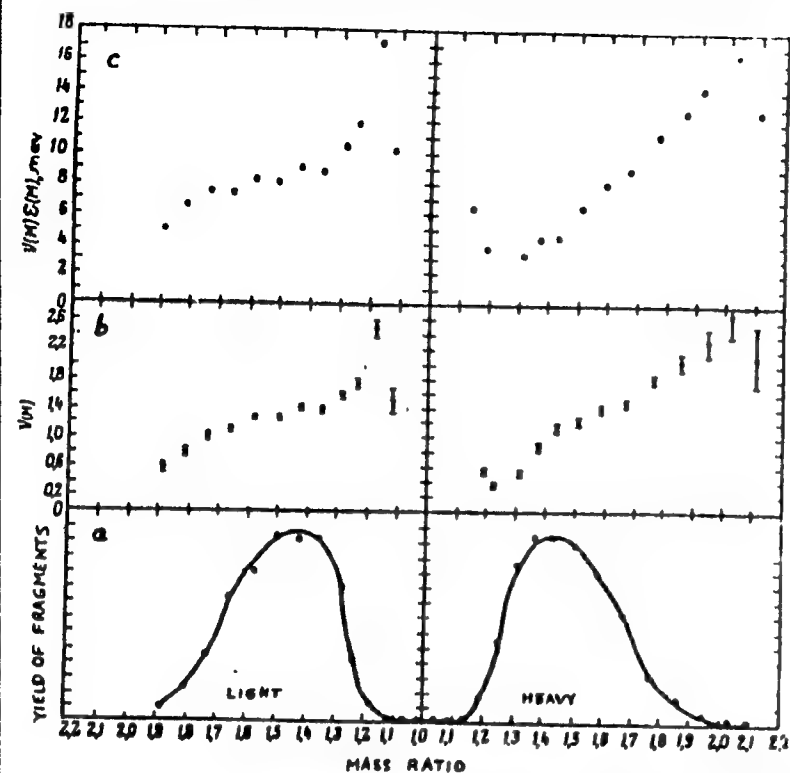$$\eta(M) = 1.5 + \int \left[ v(M) - \frac{v}{2} \right] k$$

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Number of Neutrons Emitted From Individual
Fission Fragments of U235

77298
SOV/89-8-1-2/29

for q(M), since excitation energy was found to depend
very strongly on the mass of the fragments. k can be
fixed using the relation $\bar{q} = 0.62(\bar{\nu} + 1)^2$ mev.
Results are summarized in Figs. 2 and 3. The dotted
line in Fig. 3a is from mass-spectrometer data, indicat-
ing that the resolution of the present experiment is
0.08. Fig. 2b indicates that the light fragments
emit, on the average, 17% more neutrons than the heavy
ones. In Fig. 3b, where $\nu(x) \epsilon(x)$ represents the
energy carried away by neutron from a pair of fragments,
points are from measurements on pairs of fragments
and crosses from individual fragment measurements. The
differences indicate the need for a 5% correction for
detector efficiency. The authors also calculated the
binding energies of neutrons, using the semiempirical
WeiszÄcker formula; the results are in Fig. 4. Fig. 5
contains ratios of the yields $\nu_{light}/\nu_{heavy}$ and
the combined yield of both fragments in units $\nu(x)/\bar{\nu}$.
Arrows on the abscissa indicate the most probable mass
ratio, and neither the U235 nor Cf252 curve shows any

Card 6/12

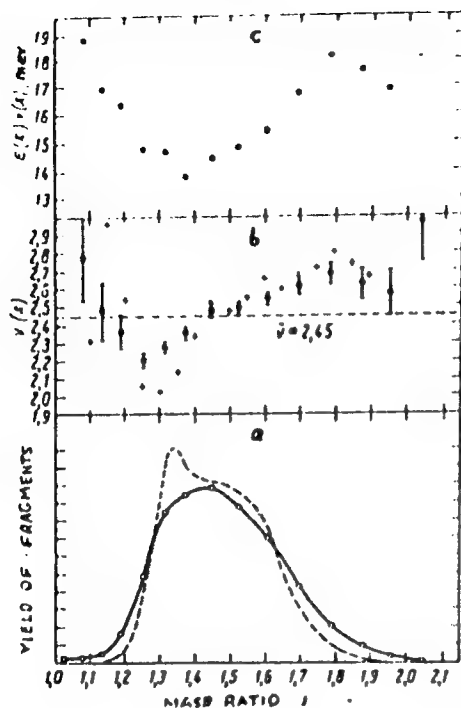77203, SOV/89-3-1-2/29

Fig. 2. Experimental data for individual fragments: (a) yield distribution of fission fragments; (b) neutron yield; (c) energy carried away by neutrons.
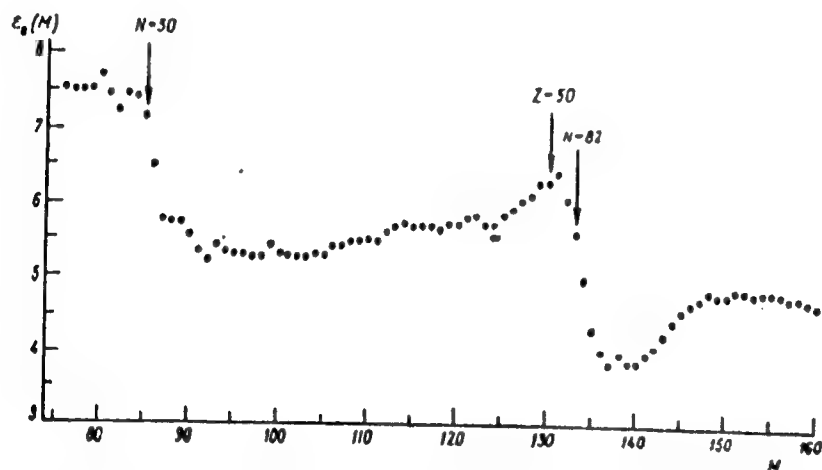
Card 7/12

77203, SOV/89-8-1-2/29

Fig. 3. Experimental
data for pairs of
fragments: (a) yield
distribution of fis-
sion fragments; (b)
neutron yield; (c)
energy carried away
by neutrons.

Card 8/12

Number of Neutrons Emitted From Individual    77208
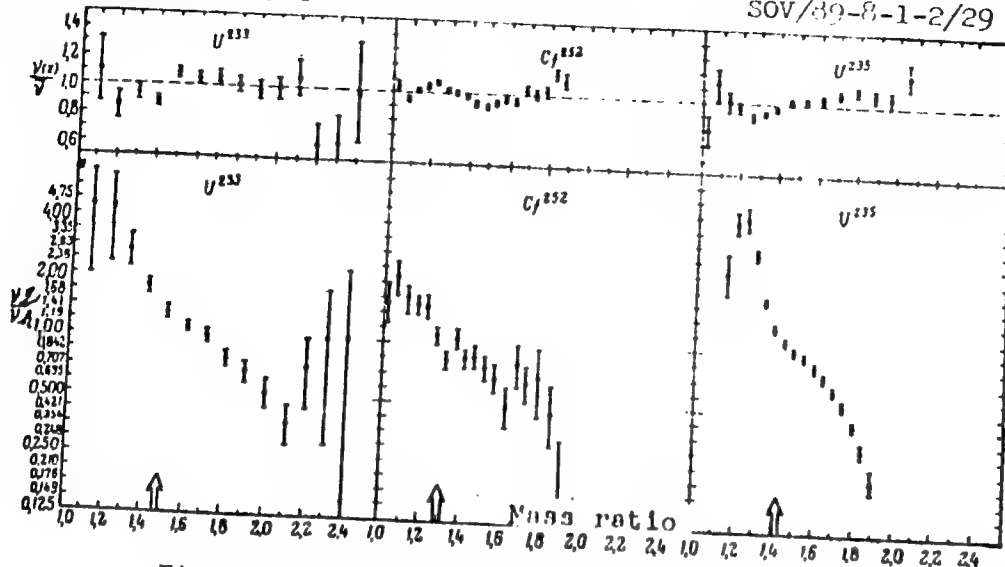Fission Fragments of U235    SOV/89-8-1-2/29



Card 9/12    Fig. 4. Calculated values of binding energies of neutrons

Number of Neutrons Emitted From Individual
Fission Fragments of $U^{235}$

Fig. 5. Ratio of neutron yield from different fragments $\nu_1/\nu_h$ and the total yield from fragment pairs $\nu(x)/\nu$ from $U^{233}$, $Cf^{252}$, and $U^{235}$ isotopes.

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Number of Neutrons Emitted From Individual
Fission Fragments of $U^{235}$

77208
SOV/89-8-1-2/29

increase of $\nu(x)$ as required according to the statisti-
cal theory of fission by Fong. The authors suspect
that the result in the case of $U^{233}$ supporting this
theory could be a result of the piling up of experi-
mental errors. If the excitation energy of the frag-
ments is due basically to their deformation, then in
the case of a nearly symmetrical fission, according to
the authors, the light fragments are much more deformed
than the heavy ones. When the mass ratio is the most
probable one, the deformations are roughly equal; when
the fission becomes highly asymmetric, the heavy frag-
ments are much more deformed than the light ones. This
could be connected to the fluctuating character of the
neck rupture of the nucleus undergoing fission, as
proposed by O. Bohr at the end of 1958 (private
communication by V. M. Strutinskiy). B. G. Yerozolim-
skiy was one of the initiators of the work; A. A. Markov
and A. A. Voronin developed and built the multichannel
analyzer, and K. S. Mikhaylov supplied advice and
helped during the construction of the scintillator.
There are 5 figures; and 17 references, 7 Soviet, 9 U.S.,

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Number of Neutrons Emitted From Individual          77208
Fission Fragments of $U^{235}$                     SOV/89-8-1-2/29

l Canadian.  The 5 most recent U.S. and Canadian refer-
ences are: Katcoff, S., Nucleonics, 16, Nr 4, 78 (1958);
Stein, W., Whetston, S., Physical Review, 110, 476
(1958); Cameron, A., A Revised Semi-Empirical Atomic
Mass Formula, Chalk River, Ontario, 1957; Fong, P.,
Physical Review, 102, 434 (1956); Fraser, J., Milton,
J., Physical Review, 93, 818 (1954).

SUBMITTED:     July 17, 1959

Card 12/12

16928

S/O 6/60/039/005/017/051
BOO /B077

*24.6600*

AUTHORS: ....., P  Ye., Mikaelyan, L. A., K..tikov, I. Ye.,
.... Y. P.

TITLE: A.......y in Double Mott Scattering and Absolute Values of
.... L...tudinal Polarization of β-Electrons

PERIODICAL: ........ eksperimental'noy i teoreticheskoy fiziki, 1960,
V.. 39  No. 5(11), pp. 1479 — 1481

TEXT: The ...... "Letter to the Editor" continues two previous works
where the ..... ......ted about the relative measurements of longitudi
nal polari....... .... the β-electrons emitted in the decay of $P^{32}$, $Sm^{153}$,
$Lu^{177}$, $H^{166}$, ...... ... Au$^{198}$. The amount of polarization differed up
t. 12%. This .. .. that the polarization deviates from the predicted
value (v/c); ... ... ... of these deviations was determined from absolute
measurements .. .. .....tron polarization from $Sm^{153}$. The degree of
polarization is ..... ... by $\langle \sigma \rangle = (1 + J_z/J_r)/(1 - J_1/J_r)S$, where $J_1$ and $J_r$ are

Card 1/4

Asymmetry in Double Mott Scattering and
Absolute Values of the Longitudinal
Polarization of Electrons

86928
S/056/60/039/005/017/05'
B006/B077

the left and right Mott scattering intensities and S a function of angle,
energy, and charge characterizing the asymmetry. In order to determine
S, the authors investigated the double scattering of unpolarized elec-
trons from gold. The results of these experiments with a scattering
angle of 120° and energies of 245 and 290 kev are reported here, the mea
surements were obtained in the ranges of 50-250 kev and 90-150°. A short
description of the experimental setup is given which is in line with the
known ones. In order to eliminate the asymmetry caused through the de-
vice, the first and scatterer was replaced by an aluminum scatterer and
$S_{Al}/S_{Au}$ was determined. Four first and four second scatterers were used
which had a thickness between 70 and 300 $\mu g/cm^2$; statistical accuracy of
S measurements was determined to be $\pm$ 3%, background was not greater
than 5%. The counting rate was 500-1500 pulses/min. Corrections for
scattering from the walls $(0.4 \pm 0.2)$%, and from the scatterer backing
$(2-4$%) as well as the finiteness of the angle of observation $(0.5$%) were
taken into account. The following values were obtained:

Card 2/4

86928

Asymmetry in Double Mott Scattering and
Absolute Values of the Longitudinal
Polarization of β particles

S/0??/??/??/008/017/05?
B006/5???

| Electron energy (kev) | s' | s | $s/s_T$ |
|---|---|---|---|
| 245 | ? ???±4% | 0.41?±?% | ?.??±?% |
| 2?0 | ?.???±4% | 0.40?±?% | ?.??±?% |

$s/s_T$ denotes the ratio of the value determined experimentally and that
obtained from Sherman's tables. The depolarization of the electrons
passing from the source to the scatterer were examined also, at electron
energies of 170 kev. It was found that the asymmetry can decrease by
(? ± ?)% due to this depolarization. The following absolute values were
obtained for 300 kev electrons:

| | | Sm$^{153}$ | Lu$^{??}$ | Ho$^{166}$ | In$^{???}$ | Au$^{198}$ |
|---|---|---|---|---|---|---|
| polarization $\langle v \rangle/(v/c)$ | ?.? | 0.97 | 0.?? | 0.9? | 0.?? | 0.91 |
| error of relative measurements in % | ?.? | . | ?.? | 1.5 | 2.? | 2.0 |

Card 3/4

86928

Asymmetry in Double Mott Scattering and
Absolute Values of the Longitudinal
Polarization of β Electrons

S/056/60/039/06 /037/065
B006/B077

The error of absolute measurements amounted to 3.5% and the deviations
from v/c were 8 g%. There are 1 figure, 1 table, and 3 references.
2 Soviet and 1 US.

SUBMITTED:       August 24, 1960

Card 4/4

SPIVAK, P.Ye.; MIKAELYAN, L.A.; KUTIKOV, I.Ye.; APALIN, V.F.; LUKASHEVICH,
I.I.; SMIRNOV, G.V.

Asymmetry of double Mott scattering of electrons in the energy
range between 45 and 245 Kev.  Zhur.eksp.i teor.fiz.  41  no.4:
1064-1068  O '61.                                    (MIRA 14:10)
                    (Electrons—Scattering)

33675
S/056/62/043/001/045/056
B102/B104

$74.6600$

AUTHORS: Apalin, V. F., Gritsyuk, Yu. N., Kutikov, I. Ye., Lebedev, V.
I., Mikaelyan, L. A.

TITLE: The number of neutrons emitted from $U^{236}$ in the region of
symmetrical fission

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,
no. 1(7), 1962, 329-330

TEXT: Results hitherto obtained by studies on the dependence of fission
neutrons on the fragment mass ratio are rather inaccurate. In order to
obtain more reliable data, the authors investigated thermal-neutron
induced $U^{235}$ fission using a double ionization chamber. In the case of
maximal distribution and symmetrical fission, the fragment yield ratio
was $\sim 10$ (true value 600). The fission neutrons were detected in $4\pi$-
geometry. The total number of fission neutrons recorded at a rate of
$\sim 25$ fissions/sec was $\approx 4 \cdot 10^{5}$. The kinetic energy $E_k$ of the fragments and
the number $\nu$ of neutrons were studied in dependence of the mass ratio
Card 1/2   * REACTOR SHOULD BE $U^{235}$

The number of neutrons emitted from ...    S/056/62/043/001/045/056
B102/B104

... A distinct correlation was established between $E_k(X)$ and $\nu(X)$. $\nu$ reaches a minimum at $X = 1.20-1.25$ which practically coincides with the $E_k$ maximum. It is of interest that $\nu(X)$ becomes the larger the more symmetrical fission is approached, so that $5.6 \pm 0.2$ neutrons/decay event are observed in the X-region from 1.00 to 1.04 (first analyzer channel). A considerable difference exists between $\nu$ in symmetrical fission and fission in the region of X, which corresponds to the $E_k$ maximum:

$\nu_{max} - \nu_{min} = 1.6 \pm 0.2$ n. If the losses due to insufficient resolution of the mass analysis are taken into account, the true $\nu$-values exceed by far the ones measured. Hence about 6 neutrons are emitted in symmetrical fission. There is 1 figure.

SUBMITTED: April 14, 1962

Card 2/2

24.6600

AUTHORS:     Apalin, V. F., Gritsyuk, Yu. N., Kutikov, I. Ye.,
             Lebedev, V. I. Mikaelyan, L. A.

TITLE:       Number of neutrons emitted from $U^{234}$ and $Pu^{240}$ in symmetric
             fission

PERIODICAL:  Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43,
             no. 6(12), 1962, 2053-2055

TEXT:   Layers of uranium or plutonium (5-6 $\mu g/cm^2$) were deposited on
collodion films ($\sim$5 $\mu g/cm^2$), coated with gold ($\sim$10 $\mu g/cm^2$) and exposed
to a neutron beam from the thermal column of a reactor. The fission
neutrons were detected in almost perfect $4\pi$ geometry with a double
ionization chamber.  A mass-ratio analyzer registered all fragments with
$E \geq 30$ Mev; the fragment counting rate was 20-30 pulses/sec.  $E_0$, the
kinetic fragment energy, was plotted against the fragment mass ratio, and
the numbers $\nu$ of fission neutrons were plotted in the same diagrams.  It
can be seen that $\nu$ has a minimum where $E_0$ has a maximum.  In the case of
Card 1/2

Number of neutrons emitted from ...

S/056/62/043/006/015/067
B102/B104

symmetric fission $\nu$ reaches a maximum; $\Delta \nu = \nu_{max} - \nu_{min} = 1.80 \pm 0.25$ for $U^{234}$ and $\Lambda \nu = 1.10 \pm 0.2$ for $Pu^{240}$. For $U^{236}$ $\Delta \nu = 1.6 \pm 0.2$ had been obtained (ZhETF, 43, 331, 1962). Owing to effects of the apparatus these values are far from the true ones. Taking those effects into account $\Delta \nu = 4.0 \pm 0.7$, $4.4 \pm 0.6$, and $3.2 \pm 0.6$ for $U^{234}$, $U^{236}$ and $Pu^{240}$. There is 1 figure.

SUBMITTED: July 16, 1962

Card 2/2

APALIN, V.F.; GRITSYUK, Ya.; KUTIKOV, I.Ye.; LEBEDEV, V.I.; MIKAELYAN,
L.A.

Number of neutrons emitted by $U^{234}$ and $Pu^{240}$ in symmetric fission.
Zhur.eksp.i teor.fiz. 43 no.6:2053-2055 D '62.      (MIRA 16:1)
        (Neutrons)    (Uranium--Isotopes)    (Plutonium)

L 58339-65    EWT(m)/EWA(h)   Feb

ACCESSION NR:   AT5010447                           UR/3136/64/000/709/0001/0007

AUTHOR:  Apalin, V. F.; Gritsyuk, Yu. N.; Kutikov, I. Ye.; Lebedev, V. I.; Mika-
elyan, L. A.

TITLE:  Kinetic energy of fragments and energy balance in the fission of U-235 by
thermal neutrons

SOURCE: Moscow.  Institut atomnoy energii. Doklady, no. 709, 1964.  Kinetiches-
kaya energiya oskolkov i energeticheskiy balans pri delenii  U²³⁵ teplovymi ney-
tronami, 1-7

TOPIC TAGS:  uranium 235, thermal neutron fission, fragment kinetic energy, energy
balance, symmetrical fission, asymmetrical fission

ABSTRACT:  The distribution of the total kinetic energy of the supplementary frag-
ments produced in the fission of $U^{235}$ by thermal neutrons was determined with the
aid of a gas ionization chamber as a function of the ratio of the fragment masses.
The ionization chamber was described by the authors elsewhere (ZhETF v. 46, 1197,
1964; Nucl. Phys. v. 55, 249, 1964).  The pulses from the ionization chamber were
fed to a multichannel ratio analyzer, 30 channels of which covered the investigated

Card 1/2

L 58039-65
ACCESSION NR:   AT5010447                                                                O

mass range.   The data reduction and the error analysis are briefly discussed.
Plots are presented of the total kinetic energy of the $U^{236}$ fragments against the
initial mass of the heavy fragment, of the spectra of the total kinetic energy of
the symmetrical-fission fragment kinetic energy, of the spectra of the total kinet-
ic energy of the fragment for several mass ratios, and of the energy balance in the
fission of $U^{236}$.  A value of 21 MeV is obtained for the difference between the aver-
age kinetic energies in symmetical fission and in fission in which the heavy frag-
ment is magic ($M_h = 130$--$132$).  The ratio of the maximum of the curve showing the
yield of the final fragments to its minimum in the case of symmetrical fission was
approximately 500:1 in these measurements.  The total energy release, obtained from
the experimental data, is in good agreement with the value calculated by the semi-
empirical Weizsacker formula in all cases, except in the region of the strongly a-
symmetrical fission.  Orig. art. has:  5 figures and 1 formula.

ASSOCIATION:    none

SUBMITTED:   00                    INCL:   00                  SUB CODE:   NP

NR REF SOV:  002                   OTHER:  008

Card 2/2

L 58340-65    EWT(m)/EPF(n)-2/EWA(h)    Pu-4
ACCESSION NR:    AT5010448                           UR/3136/64/000/710/0001/0009/

AUTHOR: Apalin, V. F.; Gritsyuk, Yu. N.; Kutikov, I. Ye.; Lebedev, V. I.; Mika-
elyan, L. A.

TITLE: Emission of neutrons from the fission fragments of U-233, U-235, and Pu-239

SOURCE: Moscow. Institut atomnoy energii. Doklady, no. 710, 1964. Emissiya ney-
tronov iz oskolkov deleniya $U^{233}$, $U^{235}$, i $Pu^{239}$, 1-9

TOPIC TAGS: fission fragment, uranium fission, plutonium fission, neutron emission,
neutron energy

ABSTRACT: This is a sequel to earlier measurements of neutron emission from indi-
vidual fragments in the fission of $U^{235}$ (ZhETF v. 46, 1197, 1964; Nucl. Phys. v. 55,
249, 1964). The present paper deals with the results of analogous measurements in
the case of the fission of $U^{233}$ and $Pu^{239}$. The measurement procedure was described
in the earlier paper. Special attention is paid to the reliability with which sym-
metrical fission events are separated. It is shown that the number of false events
registered in the region of symmetrical fission has been reduced to 15--20%. The
plot of the number of neutrons against the initial mass of the fragment exhibits a
deep minimum whose position is very close to the region of closed shells N = 82,

Card 1/2

L 58340-65
ACCESSION NR: AT5010448                                                    2

Z = 50 (M = 130--132). At this minimum the fragments emit only approximately 0.3
neutron. The curve also exhibits a maximum which has a different position for the
different nuclei and shifts towards larger masses with increasing atomic weight of
the fissioning nucleus. The position of the maximum for each of the nuclei is quite
close to a mass value which is complementary to the magic fragment. An empirical
formula is derived for the energies carried away by the neutrons from the fragments.
Some hypotheses concerning the manner in which fission proceeds are advanced. "The
authors thank J. Milton for supplying the tables compiled by him (UCRL 9883, 1962)
and to B. Geylikman and V. Strutinskiy for interesting discussions." Orig. art.
has: 6 figures and 3 formulas.

ASSOCIATION:    none

SUBMITTED:    00              ENCL:    00              SUB CODE:  NP

NR REF SOV: 006              OTHER:  012


Card 2/2

ACCESSION NR:  AP4031137                    S/0056/64/046/004/1197/1204

AUTHORS:  Apalin, V. F.; Gritsyuk, Yu. N.; Kutikov, I. Ye.; Lebedev,
V. I.; Mikaelyan, L. A.

TITLE:  On the number of neutrons emitted by U-235 fission fragments

SOURCE:  Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1197-1204

TOPIC TAGS:  uranium 235, symmetrical fission, asymmetrical fission,
neutrons emitted by fragments, fragment kinetic energy, nucleus
excitation energy, total energy release, fragment mass ratio

ABSTRACT:   Continuing earlier measurements of the total number of
neutrons emitted by both fragments in the case of fission of
$U^{233}$, $U^{235}$, and $Pu^{239}$ by thermal neutrons (ZhETF v. 43, 329 and 2053,
1962), the authors have repeated the experiments on $U^{235}$ with equip-
ment that provided greater resolution in mass analysis, so as to ob-
tain a quantitative agreement between the increase in the excitation

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ACCESSION NR:   AP4031137

energy and the decrease in the kinetic energy.  The new equipment
constituted an ionization chamber and a cadmium-containing neutron
detector.  Comparison of the data for $U^{235}$ with those for $Cf^{236}$
refutes the hypothesis advanced by Terrel (Phys. Rev. v. 127, 880,
1962) that the number of neutrons varies with the fragment mass in
the same fashion for all nuclei.  Calculations show that in the re-
gion of symmetrical fission the excitation energy of the fragments
increases by about 20 MeV.  Orig. art. has: 3 figures and 1 formula.

ASSOCIATION:   None

SUBMITTED:   27Sep63          DATE ACQ:   07May64          ENCL:   02

SUB CODE:   PH, NS            NO REF SOV:   003            OTHER:   012

Card  2/

L 52736-65   EWT(m)/EWA(h)   Peb

ACCESSION NR:  AP5013110                    UR/0367/65/001/004/0639/06??

AUTHOR:  Apalin, V.; Gritsyuk, Yu.; Kutikov, I.; Lebedev, V.; Mikaelyan, L.

TITLE:  Neutron emission from fragments of $U^{233}$, $U^{235}$, and $Pu^{239}$ in thermal-neutron fission

SOURCE:  Yadernaya fizika, v. 1, no. 4, 1965, 639-646

TOPIC TAGS:  nuclear fission, thermal neutron fission, fission fragment, neutron emission, symmetric fission

ABSTRACT:  This is a continuation of earlier measurements (ZhETF v. 43, 329, 2053, 1962; Nucl. Phys. v. 38, 193, 1962 and v. 41, 92, 1963; ZhETF v. 46, 1197, 1964) of the total number of neutrons emitted by fragments as a function of their mass ratio. In the present work the authors measured the neutron emission from fragments of $U^{233}$, $U^{235}$, and $Pu^{239}$ separated by an improved technique, and discuss the accuracy of the information obtained.  The experimental technique was the same as in the earlier work, with the fragment mass determination made by means of a double-grid ionization chamber and a liquid-organic scintillator neutron detector.  To assess

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L 52736-65
ACCESSION NR: AP5013110

the reliability of the information obtained in the symmetric-fission region, the
experimental mass distribution was compared with the results of radiochemical stu-
dies (J. Katcoff, Nucleonics v. 18, No. 11, 201, 1960). Good agreement with these
data was found everywhere except in the symmetric-fission region, where the present
data lie somewhat above the values of Katcoff. It is estimated that not more than
30% and more likely 15--20% of the events in symmetric fission are spurious. An
attempt is made to deduce a correlation between the neutron emission data and the
dynamics of the fission process at low excitation energies. "The authors thank J.
Milton for sending his tables, and B. Geylikman and V. Strutinskiy for interesting
discussions." Orig. art. has: 6 figures and 3 formulas.

ASSOCIATION: None

SUBMITTED: 16Oct64       ENCL: 00       SUB CODE: NP

NR REF SOV: 005       OTHER: 012

Card 2/2

L 60937-65   EWT(m)/EWA(h)   Peb

ACCESSION NR:   AP5014317                    UR/0367/65/001/005/0816/0820

AUTHORS:   Apalin, V.;   Gritsyuk, Yu.;   Kutikov, I.;   Lebedev, V.;   //
Mikaelyan, L.                                                        B

TITLE:   Kinetic energy of fragments and energy balance in thermal
neutron fission of U-235
      /9

SOURCE:   Yadernaya fizika, v. 1, no. 5, 1965, 816-820

TOPIC TAGS:   uranium 235, thermal neutron fission, symmetrical fission,
fragmetn energy, fragment mass distribution, magic nucleus

ABSTRACT:   The distribution of the total kinetic energy of complemen-
tary fission fragments was measured as a function of the fragment-mass
ratio, using a gas ionization chamber.   The total kinetic energy of
the fragments from the fission of $U^{235}$ by thermal neutrons was measur-
ed directly with the double-grid ionization chamber used by the authors
previously (ZhETF v. 46, 1197, 1964;   YaF v. 1, 639, 1965).   The
pulses from the ionization chamber were fed to a multichannel ratio
analyzer in which the range of ratios subtended 30 analyzer channels.

Card  1/3

L 60937-65

ACCESSION NR: AP5014317                                    O

For each mass ratio the authors measured the distribution of events
with respect to the total ionization produced by the fragments in the
chamber.  The analyzer energy scale was calibrated against time-of-
flight kinetic-energy measurements at a mass value corresponding to
the most probable fission.  A value of 21 MeV was obtained for the
difference between the average kinetic in symmetrical fission and in
fission in which the heavy fragments are magic (130 -- 132).  The
experimental results were in good agreement with those of J. Milton
and J. Fraser (Phys. Rev. Letters v. 7, 67, 1961;  Can. Jour. Phys.
40, 1626, 1962), except in the symmetric-fission region, where the
decrease in energy, compared with the value at the peak, amounts to
21 MeV.   The ratio of the maximum and minimum of the final-fragment
yield curve in symmetrical fission proved to be approximately 500:1.
The total energy release found from the experimental data is in good
agreement with calculations based on the semi empirical Weizsacker
formula, except for the regions of strongly asymmetric fission.  The
causes of the discrepancies in the latter case are not clear.  Orig.
art. has:  5 figures

Card 2/3

L 60937-65

ACCESSION NR: AP5014317

ASSOCIATION: None

SUBMITTED: 16oct64          ENCL: 00          SUB CODE: NP

NR REF SOV: 002          OTHER: 008

Card 3/3

FADDEYEV, Dmitriy Konstantinovich; PETROVSKIY, I.G., akademik, otv.red.
    Prinimali uchastiyo: SHAPIRO, A.P., student; TUSHKINA, T.A., studentka;
    BOROVSKIY, Yu.Ye., student; SMIRNOV, G.P. [deceased], student;
    KUTIKOV, L.B., student; IVANOV, F.A.; NIKOL'SKIY, S.M., prof.,
    zamestitel' otv.rd.; SKOPIN, A.I., kand.fiz.-mat.nauk, red.izdaniya;
    BARKOVSKIY, I.V., red.izd-va; BOCHEVER, V.T., tekhn.red.

[Tables of the fundamental unitary representations of Fedorov groups]
Tablitsy osnovnykh unitarnykh predstavlenii fedorovskikh grupp.
Moskva, Izv-vo Akad.nauk SSSR, 1961.  173 p. (Akademiia nauk SSSR.
Matematicheskii institut.  Trudy , vol.56)            (MIRA 14:4)

1. Leningradskiy gosudarstvennyy universitet, matematiko-mekhanicheskiy
fakul'tet (for Shapiro, Tushkina, Borovskiy, Smirnov, Kutikov).
2. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A.
Steklova (for Ivanov).
    (Crystallography—Tables, etc.)  (Groups, Theory of)

L 23790-66    EWT(d)    IJP(c)

ACC NR: AP6005757               SOURCE CODE: UR/0280/65/000/005/0042/0047

AUTHOR: Kutikov, L. M. (Leningrad)

ORG: none

TITLE: The inversion of correlation matrices and some problems in selfadjustment

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 5, 1965, 42-47

TOPIC TAGS: algorithm, mathematic matrix, computer memory, teaching machine

ABSTRACT: This work is devoted to the solution of the problem of inversion of correlation matrices (K-matrices) which are frequently encountered in the design of learning systems. The inversion of correlation matrices, or the solution of the linear equation systems related to them is often necessary in the teaching algorithm itself. In view of this, the requirements imposed upon the method of inversion in high-speed response and low load of the computer storage become particularly restrictive. A typical example is investigated. It is noted that such problems are encountered frequently. Their practical solution, however, by standard methods requires large computational devices and a considerable amount of time. The sequential input of information makes it necessary to construct an inverse algorithm having a recurrent character. The author proposes a method of inversion of the K-matrix. This procedure makes it possible in many cases to write out an inverse matrix explicitly and in all

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ACC NR: AP6005757

cases in a form applicable for simple numerical computations. The method used is related to the use of orthogonal polynomials. It may be useful in the construction of some self-adjusting algorithms. In conclusion, the author expresses his gratitude to S. I. Sirvidas and L. A. Flekser for a useful discussion of the paper. Orig. art. has: 18 formulas.

SUB CODE: 09, 12 / SUBM DATE: 16Dec64 / ORIG REF: 003 / OTH REF: 004

Card    2/2

AUTHOR:      Kutikov, M.E.   (Gomel')                    47-6-16/37

TITLE:       Useful Advice: (Poleznyye sovety) Obtaining Strong Currents for
             Experiments in Electromagnetism (Polucheniye sil'nykh tokov
             dlya opytov po elektromagnetizmu)

PERIODICAL:  Fizika v Shkole, 1957, # 6, page 63 (USSR)

ABSTRACT:        For experiments in electromagnetism, currents of several
             ten amperes  are applied.  These currents can be successfully
             obtained from the school's dismountable transformer by winding
             15 - 20 turns of 2-3 mm copper wire on the core.  A permanent
             reel with such windings can also be made.  It should be fur-
             nished with special clamps to connect the outer wires which
             must also be of heavy-gage.  A current of 40-50 amp with a
             voltage of 2 - 3 v at the end of the winding can be obtained,
             sufficient for carrying out the experiment, without damage to
             the transformer.

ASSOCIATION: 9th ShRM, Gomel' (9-ya ShRM, g. Gomel')
AVAILABLE:   Library of Congress

Card 1/1

KUTIKOV, S.G.

Reclaiming corrugating and piling apparatus. Stroi.mat. 8
no.1:23-26 Ja '62. (MIRA 15:5)

1. Glavnyy inzhener Sebryakovskogo kombinata asbestotsementnykh
izdeliy.
(Building materials industry—Equipment and supplies)
(Asbestos cement)

KUTIKOV, S.G.

Automatic feeding of asbestos. Strol. mat. 8 no.8:24-25
Ag '62.

(MIRA 15:9)

1. Glavnyy inzhener Sebryakovskogo kombinata asbestotsementnykh
izdeliy.
(Asbestos cement) (Automatic control)

KUTIKOV, S.

Feeding and Feeding Stuffs

Stabilization of the feed supply and development of livestock production on
collective farms in the Ukrainian Poles'ye.  Sots. sel'khoz. No. 12, 1951.

9.  Monthly List of Russian Accessions, Library of Congress, _____June_____ 195/2, Uncl.

KUTIKOV, Samuil Iosifovich.

Ukrainian Sci-Res Inst of Livestock Breeding.  Academic
degree of Doctor of Agricultural Sciences, based on his
defense, 10 November 1954, in the Council of the All-Union
Sci-Res Inst of Livestock Breeding, of his dissertation entitled
"Ways to Develop Productive Livestock-Breeding and to Strengthen
the Feed Base in the Kolkhozes of Poles'ye Ukraina".

Academic degree and/or title:  Doctor of Sciences

SO:  Decisions of VAK, List no 7, 26 Mar 55, Byulleten'
     MVO SSSR, No. 14, July Moscow pp 4-22, Uncl.
     JPRS/NY-429

Kutikov, S.

USSR / Cultivated Plants.  General Problems                    L-1

Abs Jour  : Ref Zhur - Biol,, No 6, March 1957, No 22644

Author    : Kutikov, S.

Inst      : Not given

Title     : Development of Agriculture in the Ukrainian Forest Area.

Orig Pub  : Zots. s. kh. 1955, No 7, 26-33

Abstract  : The Ukrainian Forest area is divided into the following
            microzones:  grain-potato-flax, grain-potato-hemp, and
            grain-potato-tobacco zones.  The most important problem
            of the Forest area is the crop increase of agricultural
            crops.  This problem may be solved by utilization of turf
            fertilizers in the form of turf-composts introduced in a-
            mounts of 10 - 12 tons/hectare.  Of great importance is

Card      : 1/3

USSR / Cultivated Plants. General Problems. L-1

Abs Jour : Ref Zhur - Biol., No 6, March 1957, No 22644

Abstract : the introduction of lupine sowings as a green fertilizer
on an area up to 600 - 650 thousand hectares. The largest
reserve for increasing total volume of grain fodders in
the Forest zone consists of widespread corn plantings. In
1955, more than 300,000 hectares of corn were planted and
reaped. In 1957, the gross weight of corn in the total
grain crop consisted of 18 - 19%. It is expedient to broa-
den potato planting in the Forest zone on an average up to
k0 percent of the total area. It is profitable to utili-
ze lupine fertilizer in potato sowing. The widespread po-
tato plantings will considerably aid the Forest zone to
become a fodder base. The protein deficiency created in
these conditions will be liquidated by the planting of al-
kaloidless fodder lupine. An especially beneficial effect
is produced by utilizing this plant combined with potatoes

Card : 2/3

USSR / Cultivated Plants. General Problems. L-1

Abs Jour : Ref Zhur - Biol., No 6, March 1957, No 22644

Abstract : in pig feeding. The plantings of fodder lupine should be increased up to 300-350 thousand hectares. The widening of a fodder base in the Forest zone will insure the develop- ment in near-city districts of meat, dairy-meat and dairy- animal production. There are realistic prospects in the Forest zone of developing commercial butterproduction as well as intensive swine breeding.

Card : 3/3

KUTIKOV, S.

Agricultural specialization. Vop.ekon. no.3:77-88 Mr '59.
(MIRA 12:5)

(Ukraine--Sugar beets)

KUTIKOV, S.I., prof.; OLEYNIK, V.I., starshiy nauchnyj sotrudnik

Organization of farms specialized in meat production in the vicinity
of sugar refineries. Zhivotnovodstvo 23 no.2:26-32 F '61.
(MIRA 15:11)

1. Nauchno-issledovatel'skiy institut zhivotnovodstva lesostepi
i Poles'ya UkrSSR.
(Bogodukhov District--Beef cattle--Feeding and feeds)
(Sugar manufacture--By-products)

PSHENICHNYY, P.D., akademik, otv. red.; DAKHNOVSKIY, N.V., red.;
KUTIKOV, S.I., doktor sel'khoz. nauk, red.; SVECHIN, K.B., prof.,
doktor sel'khoz. nauk, red.; KOVALENKO, N.A., kand. sel'-
khoz. nauk, red.; MOKEYEV, A.Ye., kand. sel'khoz. nauk,
red.; MAZUR, V.N., red.; KVITKA, S.P., tekhn. red.

[Ways for increasing meat production; materials of a session]
Puti uvelicheniia proizvodstva miasa; materialy sessii.  Kiev,
Izd-vo Ukrainskoi Akad. sel'khoz.nauk, 1962.  199 p.
                                          (MIRA 15:7)

1. Kiyev. Ukrains'ka Akademiia sil's'kohospodars'kykh nauk.
Otdeleniye zhivotnovodstva. 2. Ukrainskiy nauchno-issledovatel'-
skiy institut ptitsevodstva, Chlen-korrespondent Ukrainskoy Aka-
demii sel'skokhozyaystvennykh nauk (for Dakhnovskiy). 3. Ukrain-
skaya Akademiya sel'skokhozyaystvennykh nauk (for Pshenichnyy).
4. Nauchno-issledovatel'skiy institut zhivotnovodstva Lesostepi
i Poles'ya USSR (for Kutikov). 5. Uchebnaya chast' Ukrainskoy
Akademii sel'skokhozyaystvennykh nauk (for Svechin). 6. Poltav-
skiy nauchno-issledovatel'skiy institut svinovodstva (for Kova-
lenko). 7. Ukrainskiy nauchno-issledovatel'skiy institut zhivot-
novodstva stepnykh rayonov im. M.F.Ivanova, "Askaniya-Nova"
(for Mokeyev).
                   (Ukraine—Stock and stockbreeding)

KUTIKOV, S.I., prof.; OLEYNIK, V.I., nauchnyy sotrudnik

Effectiveness of raising young cattle for meat in a sugar beet zone.
Zhivotnovodstvo  22  no.7:26-33  '60.                    (MIRA 16:5)

1. Nauchno-issledovatel'skiy institut zhivotnovodstva lesostepi
i Poles'ya UkrSSR.
              (Ukraine—Beef cattle—Feeding and feeds)
                    (Sugar beets as feed)

KUTIKOV, S.I., prof.; DRYGA, A.P., starshiy nauchnyy sotrudnik

Main problems in the organization of specialized swine
fattening farms. Zhivotnovodstvo 24 no.6:25-31 Je '62.
(MIRA 17:3)

1. Nauchno-issledovatel'skiy institut zhivotnovodstva
lesostepi i Poles'ya UkrSSR.

KUTIKOV, S.I., prof., red.; TOGOBITSKAYA, N.V., red.

[Economic efficiency of methods for the intensification of livestock breeding] Ekonomicheskaia effektivnost' metodov intensifikatsii zhivotnovodstva. Kiev, Gossel'- khozizdat USSR, 1963. 293 p.          (MIRA 17:3)

TROYEPOL'SKIY, V. N., inzh.; KUTIKOV, V. M., tekhnik

Manipulator for automatic build-up welding. Svar. proizv.
no.10:38-39 O '62. (MIRA 15:10)

1. Proyektno-konstruktorskoye byuro Glavnogo upravleniya po
mekhanizatsii stroitel'nykh rabot.

(Electric welding—Equipment and supplies)

L 2396-66    EWT(d)/EWP(1)    IJP(c)    BC

ACCESSION NR: AP5022978

UR/0103/65/026/008/1385/1390
62-503.53

AUTHOR:  Kutikov, Yu. A. (Leningrad)

TITLE:  The operation of servosystems with autocorrelators in the presence of noise

SOURCE:  Avtomatika i telemekhanika, v. 26, no. 8, 1965, 1385-1390

TOPIC TAGS:  servosystem, Fokker Plank equation, signal analysis, signal correlation, signal noise separation

ABSTRACT:  The present paper investigates the operation of a nonlinear servosystem with a correlator serving as the measuring element.  Such a system can be used, in particular, for the tracking of the mean frequency of the spectrum of a narrow-band stochastic signal in presence of noise.  Using the two-dimensional Fokker-Plank equation the author determines the errors in such mean frequency tracking caused by a wideband noise.  Orig. art. has:  32 formulas and 1 figure.

ASSOCIATION:  None

SUBMITTED:  27Mar64          ENCL:  00                SUB CODE:  IE, DP
NO REF SOV:  002             OTHER:  001

Card  1/1

KUTIL, I.; DURACHKA, F.; SHIMEK, I.

Use of polyectrolytes for the recovery of gold from waste waters.
Zhur.prikl.khim. 34 no.11:2430-2435 N '61.          (MIRA 15:1)

1. Gosudarstvennyy institut blagorodnykh metallov, Praga i
Issledovatel'skiy institut sinteticheskikh smol i lakov, Pardubitse.
          (Waste products)          (Gold)

TRAVNICEK, R.; BELAN, A.; PIRK, F.; technicka spoluprace: BUJKA, L.;
        KLAINOVA, E.; KRIZOVA, M.; KUTIL, V.

Our experience with roentgenographic cinematography of the digestive
tube. Cesk.rentg. 15 no.1:10-16  F '61.

1. Ustav klinicke a exoerimentalni chirurgie, red. prof. Dr.Sc.
dr. B. Spacek. Vyzkumny ustav vyzivy lidu, red.doc. dr. J.Masek,
Praha-Krc; Laboratore CSF - Barrandov.
            (GASTROINTESTINAL SYSTEM radiog)
            (CINEFLUOROGRAPHY)

PIRK, F.; BELAN, A.; TRAVNICEK, R.; BUDINOVA-SMELA, J.; FRYNTOVA, A.: technicke
spoluprace BUFKA, L.; KRIZOVE, M.; KUBIASOVE, E.; KUTILA, L.

Our experiences with roentgen cinematography in cerebral angiography.
Preliminary report. Cesk. neur. 24 no.1:51-53  Ja '61.

1. Ustav pro vyzkum vyzivy lidu, Praha, reditel doc. MUDr. J. Masek -
Ustav pro klinickou a experimentalni chirurgii, Praha, reditel profesor
MUDr. B. Spacek - Oddeleni pro cevni onemocneni mozku, predn. doc.
MUDr. J. Budinova-Smela, Laboratore statniho filmu, Barrandov.

(CEREBRAL ANGIOGRAPHY)

SAZONOV, A.N., inzh., otvetstvennyy red.; TIL'TIN, O.K., inzh., red.;
BRISKINA, A.I., inzh., red.; KALMYKOV, N.V., inzh., red.; KUTIKOVA,
A.L., inzh., red.; OALANOV, I.O., inzh., red.; STEL'MAKH, A.N., red.
izd-va; SHKLYAR, S.Ya., tekhn. red.

[Rules for organization and safe operation of gas producer stations
operated on peat] Pravila ustroistva i bezopasnoi ekspluatatsii
torfianykh gazogeneratornykh stantsii. Moskva, Ugletekhizdat, 1957.
34 p.                                                     (MIRA 11:7)

1. Russia (1923-    U.S.S.R.) Komitet po nadzoru za bezopasnym
vedeniyem rabot v promyshlennosti i gornomu nadzoru.
                   (Peat)     (Gas producers)
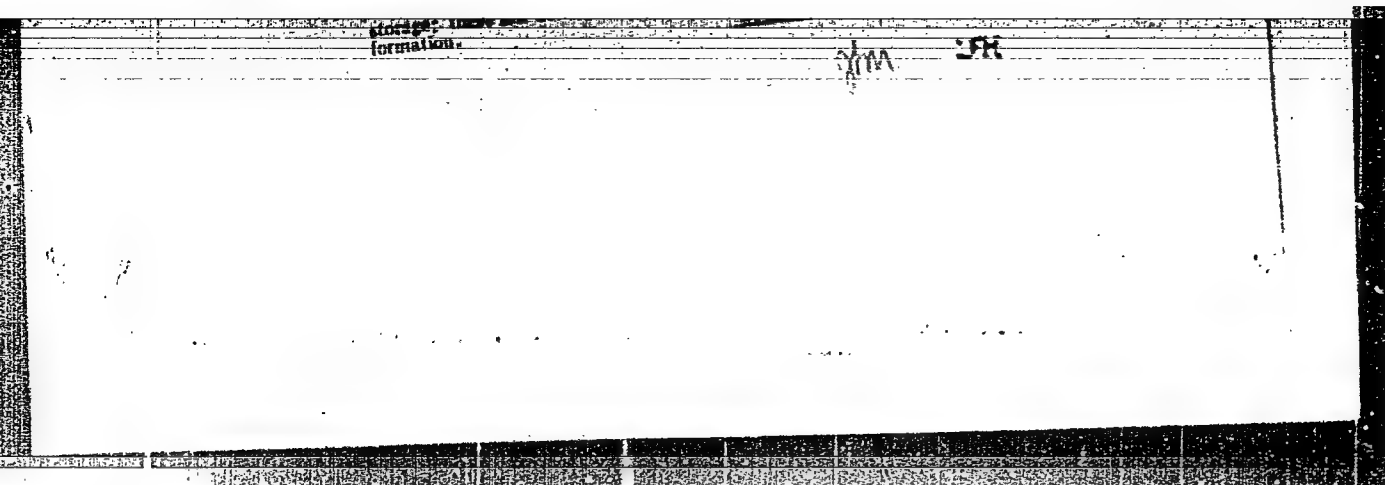
KUTIKOVA. L.A., kand. biol. nauk

A new rotifer from the Antarctic. Inform. biul. Sov. antarkt.
eksp. no.2:45-46  '58.                              (MIRA 12:8)

1.Zoologicheskiy institut AN.
            (Antarctic regions--Rotifera)

KUTIKOVA, L.A., kand.biol.nauk

Rotifer fauna in shore waters of eastern Antarctic. Infrom.biul.
Sov.antark.eksp. no.3:99 '58.                                      (MIRA 12:4)

1. Zoologicheskiy institut AN SSSR.
            (Antarctic regions--Rotifera)

RODINA, A.G.; KUTIKOVA, L.A.

Observations of Daphnia Basins at the Vimba-Bleak Hatchery.
Trudy Zool.inst. 26:427-438 '59.      (MIRA 13:5)
(Paekups Valley--Daphnia)

KUTIKOVA, L.A.

Rotifers (Rotatoria) of the genus Polyarthra Ehr. of the Luga
River in Leningrad Province. Trudy Zool.inst. 31:453-462 '62.
(MIRA 16:1)

(Luga River—Rotifera)

KUTIKOVA, L.A.

Rotifers (Rotatoria) in Luga District, Leningrad Province.
Trudy Zool.inst. 31:463-492 '62.                    (MIRA 16:1)
(Luga District—Rotifera)

KUTIKOVA, L.A.; BOGOSLOVSKIY, A.S.

Brief news and information. Zool. zhur. 42 no.11:1748-1749 '63.
(MIRA 17:2)

KUTIKOVA, L.A.

Two rotifers of the genus Notholca from Lake Baikal and
Irkutsk Reservoir. Trudy Lim. Inst. 11:177-181  '64.

(MIRA 18:11)

L 29645-66    ETC(f)    RM/DS

ACC NR:  AP6020146                                SOURCE CODE:  CZ/0008/65/059/012/1449/1450

AUTHOR:  Kutil, Jiri (Senior); Kutil, Jiri (Junior)

ORG:  State Testing Laboratory for Precious Metals, National Assembly CSSR, Prague
(Statni skusebna pro drahe kovy, Narodni Shromazdeni CSSR)

TITLE:  Simple signalling and controlling device for laboratory work with ion-exchange
columns

SOURCE:  Chemicke listy, v. 59, no. 12, 1965, 1449-1450

TOPIC TAGS:  ion exchange, laboratory instrument

ABSTRACT:  The apparatus is designed to signal when a given amount of eluate from a
column has been collected.  It may be designed in such a way that future supply of the
effluent to the apparatus is interrupted.  The elution solution must be electrically
conductive.  The apparatus was used by the authors in work with ion exchange columns.
Orig. art. has:  1 figure.  /JPRS/

SUB CODE:  07  /  SUBM DATE:  06Nov64  /  ORIG REF:  002

Card  1/1  cl

SIMAN, Josef, inz.; SCHMIDL, Milan; KUTILEK, Alois; KAVAN, Alois

Use of plastics in packaging Olomouc cheese.  Prum potravin 14 no.4: 172-175 Ap '63.

1. Vyzkumny ustav mlekarensky, Praha (for Siman and Schmidl).
2. Severomoravske mlekarny, n.p., Olomouc (for Kulitek and Kavan).

KUTILEK, M.

KUTILEK, M. Criteria for establishing irrigation norms and the use of
waste water in the meat industry. p. 96.

Vol. 5, No. 3, Mar. 1955
VODNI HOSPODARSTVI
TECHNOLOGY
Praha, Czechoslovakia

So: East European Accessions, Vol. 5, No. 5, May 1956

*Kutilek, M.*

CZECHOSLOVAKIA/Soil Science - Physical and Chemical Properties     J-3
            of Soils.

Abs Jour  :  Ref Zhur - Biol., No 3, 1958, 10504

Author    :  Kutilek, M.
Inst      :  —
Title     :  Creating a Soil Structure by Application of Artificial
             Polymers.

Orig Pub  :  Vodni hospodarstvi, 1955, 5, No 12, 452-456

Abstract  :  Potassium polymethacrylite, in a concentration of 0.1% of
             the weight of the fine soil /melkozem/, was applied to im-
             prove the soil structure. The soil structure was improved,
             as were its air and water regimes.  In addition, the deri-
             ved aggregates were not artificially reinforced non-water-
             penetrable particles, and no negative properties were noti-
             ceable in the soil.  The normal life of the microorganisms
             was not disturbed.

Card 1/1

KUTILEK, M.

KUTILEK, M.  New experience with irrigation means of town sewage. p. 259

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Vol. 35, no. 10, Oct. 1956
VODNI HOSPODARSTVI
TECHNOLOGY
Praha, Czechoslovakia

So:  East European Accession Vol. 6, no. 2, 1957